Suppose v is a vector<int> with at least one element. Write code to (6 pts each):

1. Print the number of elements in v.
   ```
   // ANSWERS
   cout << int(v.size());
   ```

2. Print the first element in v.
   ```
   cout << v[0];
   ```

3. Print the sum of the elements in v.
   ```
   int sum = 0;
   for (int i=0; i<int(v.size()); ++i)
     sum += v[i];
   cout << sum;
   ```

4. Print the number of elements in v that are equal to 0.
   ```
   int count = 0;
   for (int i=0; i<int(v.size()); ++i)
     if (v[i] == 0)
       ++count;
   cout << count;
   ```

5. Print the largest element in v (which could be negative).
   ```
   int largest = v[0];
   for (int i=1; i<int(v.size()); ++i)
     if (v[i] > largest)
       largest = v[i];
   cout << largest;
   ```

6. Print "sorted" if and only if the elements of v are in decreasing order (for example \{9, 8, 5, 5, -2, -3\}).
   ```
   bool sorted = true;
   for (int i=1; i<int(v.size()); ++i)
     if (v[i] > v[i-1])
       sorted = false;
   if (sorted)
     cout << "sorted";
   ```

7. Rearrange the elements of v so that all of the even elements are first (e.g. \{8, -2, 9, 5, 5, -3\}).
   ```
   for (int i=int(v.size())-1; i>0; --i)
     for (int j=0; j<i; ++j)
       if (v[j]%2 != 0 && v[j+1]%2 == 0)
         swap(v[j], v[j+1]);
   ```

8. Double the size of the vector with the sequence repeated (e.g. \{8, -2, 9, 5, 5, 3, 8, -2, 9, 5, 5, 3\}).
   ```
   int n = int(v.size());
   for (int i=0; i<n; ++i)
     v.push_back(v[i]);
   ```

Which of the following statements would be legal in function f() below (4 pts each):

9. a = b; yes
10. b = c; yes
11. c = a; no
12. b = 100; yes
13. return a+b+c; yes

If x is an int, which of the following statements would be legal in main()? (4 pts each):

14. x = f(1, 2, 3); no
15. f(x, x, x); yes
16. x = f(f(x, x, x), x, x+x); yes
17. Write a function readline(s) that reads a line of input into string s (like getline(cin, s)) and returns true if successful, e.g. (10 pts)
   ```
   // copy input to output line by line
   string s;
   while (readline(s))
     cout << s << "\n";
   // ANSWER
   bool readline(string& s)
   {
     return getline(cin, s);
   }
   ```

18. Write a function that takes a vector<double> by const reference and returns the average of the elements (10 pts).
   ```
   // ANSWER
   double average(const vector<double>& v)
   {
     double sum = 0;
     for (int i=0; i<int(v.size()); ++i)
       sum += v[i];
     return sum / int(v.size());
   }
   ```